

## 4.4 BIOLOGICAL RESOURCES

This section includes an analysis of the potential effects of the proposed project on biological resources, including plants, wildlife, and fish that occur or have the potential to occur in the project area. The analysis tiers off of the Bidwell-Sacramento River Park (BSRSP) General Plan and Draft Environmental Impact Report (Park Plan) which considered the potential impacts to biological resources resulting from implementation of the Park Plan (Park Plan Section 4.6.4). As described in Chapter 1 of this EIR, the proposed project actions are consistent with those identified in the Park Plan.

### 4.4.1 ENVIRONMENTAL SETTING

#### SOURCES OF INFORMATION

The information presented in this section is based on review of existing documents and other relevant information, including aerial photography, habitat maps, and biological resource databases. The following documents were reviewed during preparation of the biological resources analyses:

- ▶ California Department of Parks and Recreation. 2003 (December). *Bidwell-Sacramento River Park General Plan and Draft Environmental Impact Report*. Prepared by EDAW, Sacramento, CA.
- ▶ California Bay-Delta Authority. 2005 (June). *Sacramento River–Chico Landing Subreach Habitat Restoration Project Draft Environmental Impact Report*. Prepared by EDAW, Sacramento, CA.
- ▶ U.S. Fish and Wildlife Service. 2005a (July). *Comprehensive Conservation Plan and Environmental Assessment - Sacramento River National Wildlife Refuge*. California/Nevada Refuge Planning Office, Sacramento, CA.
- ▶ California Department of Fish and Game. 2003. *Comprehensive Management Plan for the Sacramento River Wildlife Area*.
- ▶ California Department of Parks and Recreation. 2007 (August 31). *Riparian Habitat Restoration Plan for the Nicolaus Property Sacramento River (RM 195)*. Prepared by The Nature Conservancy, North Central Valley Office, Chico, CA.
- ▶ California Department of Parks and Recreation. 2007 (December). *Riparian Habitat Restoration Plan for Singh Unit Sacramento River (RM 194)*. Prepared by The Nature Conservancy, North Central Valley Office, Chico, CA.

Documents that provided information relevant to this analysis are cited throughout this section, and corresponding references are included in Chapter 9, “References.”

In addition to the resources listed above, EDAW biologists conducted a reconnaissance survey of the project area on September 27, 2007. The biologists walked the full extent of both parcels, including the riparian habitats along Mud Creek and Big Chico Creek.

#### REGIONAL CONTEXT

The proposed project area is located in the floodplain of the Sacramento River between river miles (RM) 195 and 194. Both the Singh and Nicolaus units are within the “Inner River Zone,” which is defined as the estimated portion of river system that has experienced river channel migration in the past 100 years and is likely to experience channel movement over the next 50 years (Sacramento River Conservation Area Forum [SRCAF] 2002).

The biological resources of the project area are shaped and supported by the physical and hydrological patterns of the Sacramento River system. As is characteristic of the middle Sacramento River, major physiographic features of the project area include floodplains, basins, terraces, active and remnant channels, and oxbow sloughs. These features, together with the historic and current hydrologic and dynamic meander patterns of the Sacramento River, provide for a diverse array of riparian plant communities along the river channel. The majority of the historic riparian forest habitat in California was converted over the past 150 years to agricultural, urban, and rangeland uses, and many river systems are now bounded by levees. Conversion of riparian habitat along the Sacramento River was extensive, as well; however, much of the river between Red Bluff and Colusa remains unleveed, enabling substantial areas of remnant riparian communities, especially in the Inner River Zone. As a result of the conversion, most of the mature valley oak woodland and savannah and other mature riparian forest community types further from the river's edge are now absent from much of the Sacramento River corridor.

In the reach adjacent to the Singh and Nicolaus properties, the Sacramento River is a large, meandering river. Large gravel bars are common throughout the greater reach, often becoming islands as channels shift. In certain stretches, riparian vegetation and floodplain areas remain connected to the river due to the lack of narrowly spaced levees. Flows vary seasonally due to precipitation patterns and release schedules out of Shasta Dam. In the winter and spring of high precipitation years the Sacramento River reaches high flow levels and spills onto its floodplain. In the project vicinity, the Sacramento River may expand into the project site and/or back up Big Chico and Mud creeks to flood the project area. See Section 4.3, "Hydrology, Water Quality, and River Geomorphology," for a discussion of the current hydrological and geomorphological conditions of the project area.

## **HABITAT TYPES**

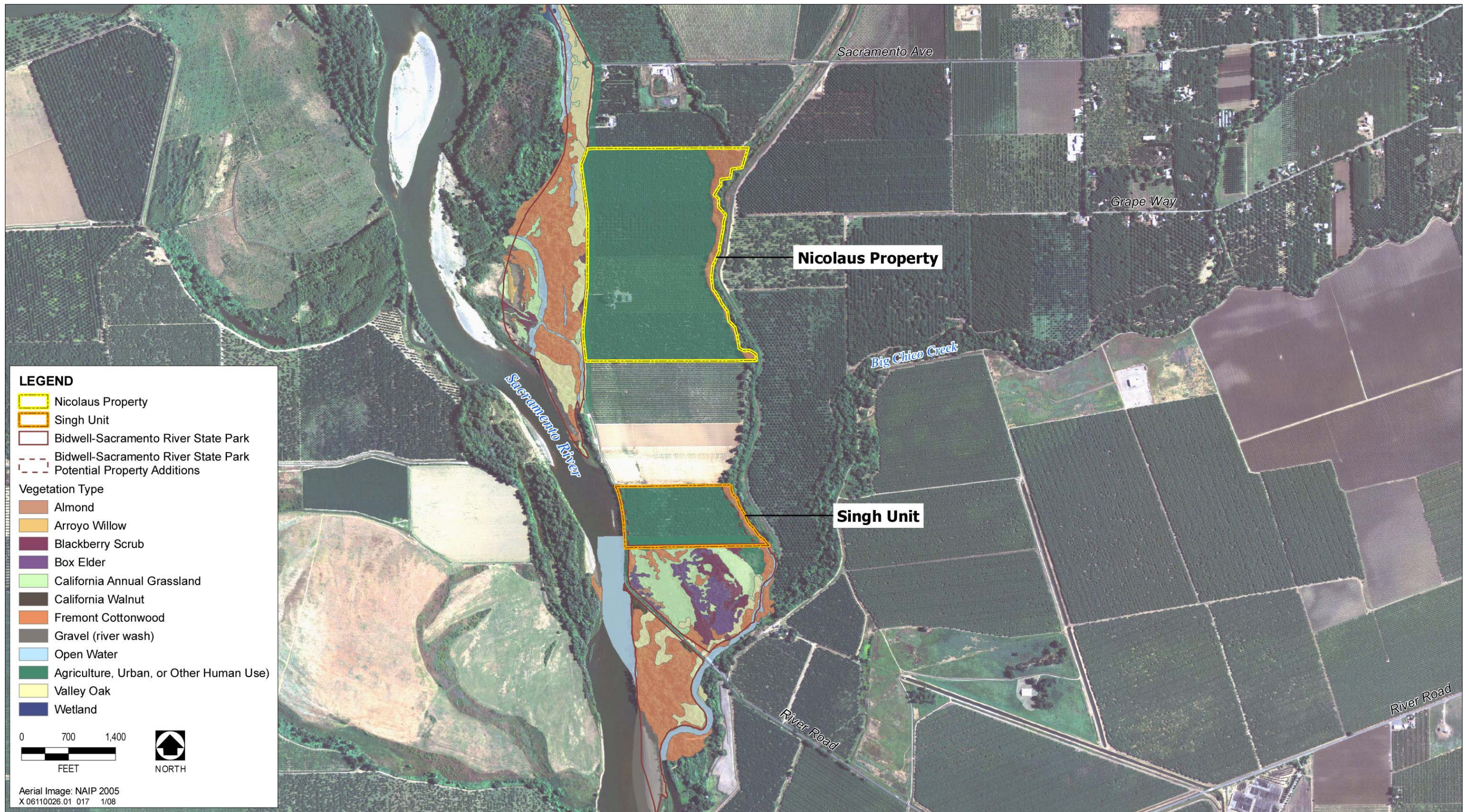
The Singh Unit and Nicolaus property are presently in walnut and almond orchard production, the two crop types in the project area where project activities are planned to occur. The adjacent lands support a variety of habitat types, including orchards, row crops, blackberry scrub, willow scrub, cottonwood riparian forest, mixed riparian forest, valley oak woodland, and freshwater marsh. The only native habitat type present within the parcel boundaries are narrow stands of cottonwood riparian forest on the eastern edge of the properties along Mud Creek. The location and extent of the habitat types present in the project area are depicted in Exhibit 4.4-1. Descriptions of native habitat types occurring in the project area are based on those contained in Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986) and the California Manual of Vegetation (Sawyer and Keeler-Wolf 1995).

Cottonwood riparian forest is a tall, dense, winter deciduous riparian forest dominated by Fremont cottonwood (*Populus fremontii*) and one or more species of willow (typically Goodding's black willow [*Salix gooddingii*] in the project area). The understory vegetation is dense and typically includes seedlings and saplings of shade tolerant species such as California box elder (*Acer negundo* var. *californica*) and Oregon ash (*Fraxinus latifolia*), as well as cottonwood and willow seedlings and saplings. Vines such as California wild grape (*Vitis californica*) are also common. This habitat type is referred to as Fremont Cottonwood Series in the *Bidwell-Sacramento River Park General Plan and Draft Environmental Impact Report*.

## **NONNATIVE INVASIVE PLANT SPECIES**

Nonnative (exotic, alien, non-indigenous) species are those that have been introduced through human activities, either incidentally or deliberately. Many nonnative plant species are not invasive and do not have adverse effects on native plant and animal communities. However, some invasive nonnative species have resulted in the transformation of native plant communities to nonnative plant communities with fewer native plants and degraded wildlife habitat. Table 4.4-1 contains a list of invasive species known to occur within the project area.





Source: GIC 2003, DPR 2003, and NAIP 2005

# Existing Habitat Types in the Project Area

Exhibit 4.4-1



<b>Table 4.4-1</b> <b>Invasive Plants Known to Occur in the Project Area</b>		
Scientific Name	Common Name	Cal-IPC/State Status <sup>1</sup>
<i>Ailanthus altissima</i>	Tree-of-heaven	Moderate/P
<i>Arundo donax</i>	Giant reed	High/P
<i>Centaurea solstitialis</i>	Yellow starthistle	High/C
<i>Conium maculatum</i>	Poison hemlock	Moderate/--
<i>Eucalyptus camaldulensis</i> , <i>E. sp.</i>	Red gum, eucalyptus	Moderate/-- ( <i>E. globulus</i> )
<i>Ficus carica</i>	Edible fig	Moderate/--
<i>Juglans californica</i> (orchard rootstock or other hybrids <sup>2</sup> )	California walnut	--/--
<i>Lepidium latifolium</i>	Perennial pepperweed	High/B
<i>Parthenocissus cinquefolia</i>	Virginia creeper	--/--
<i>Prunus dulcis</i> , <i>P. sp.</i>	Almond, prune (orchard rootstock)	Limited/--
<i>Robinia pseudoacacia</i>	Black locust	Limited/--
<i>Rubus armeniacus</i>	Himalayan blackberry	High/--
<i>Tamarix parviflora</i>	Tamarisk, salt cedar	High/P
<i>Vinca major</i>	Periwinkle	Moderate/--
<i>Phytolacca Americana</i>	Common poleweed	--/--
<sup>1</sup> Cal-IPC Status: High = species that have severe ecological impacts on physical processes, plant and animal communities and vegetation structure; widespread. Moderate = species with substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities and vegetation structure; regional Low = species that are invasive but their ecological impacts are minor on a statewide level; species that may be locally persistent and problematic State (CDFA) Status: B = Eradication, containment, control or other holding action at the discretion of the commissioner. C = State endorsed holding action and eradication only when found in a nursery, action to retard spread outside of nurseries at the discretion of the commissioner, reject only when found in a crop seed for planting, or at the discretion of the commissioner. P = Proposed additions to the CDFA Noxious Weed List in the California Code of Regulations <sup>2</sup> The ecology and taxonomy of this species as well as the extent of hybridization between native and nonnative walnut species needs study. It may be considered an invasive plant after further research and evaluation.		
Source: Cal-IPC 2006, EDAW 2007		

The state and federal government both have laws and regulations protecting commerce and environmental lands from damages caused by invasive plants. The California Department of Food and Agriculture and federal government maintain lists of noxious weeds for the purpose of eradication or control.

The California Invasive Plant Council (Cal-IPC) has developed a list of nonnative plants that pose serious problems in native ecosystems and rangelands (Cal-IPC 2006). These species are classified based on the level of threat and invasiveness. Plant are given an overall rating of “High”, “Moderate”, or “Limited” based on an evaluation of 13 criteria, which are divided into three sections assessing Ecological Impacts, Invasive Potential and Ecological Distribution. Plants with an overall rating of “high” (species that have severe ecological impacts on physical processes, plant and animal communities and vegetation structure; widespread) that were found in the vicinity of the project area include giant reed, yellow starthistle, Himalayan blackberry, tamarisk, and perennial pepperweed. These species have been documented as aggressive invaders that displace natives and transform or disrupt native habitats. Plants with an overall rating of “moderate” (species with substantial and apparent-but

generally not severe-ecological impacts on physical processes, plant and animal communities and vegetation structure; regional) that occur in the vicinity of the project area include tree-of-heaven, eucalyptus, periwinkle, poison hemlock and edible fig. Plants in the project area with an overall rating of “limited” (species that are invasive but their ecological impacts are minor on a statewide level; species that may be locally persistent and problematic) include black locust and wild almond.

## WILDLIFE

The current wildlife habitat value of the project site is limited, as both properties are actively managed for walnut and almond production, and are kept clear of understory vegetation. Walnut and almond orchards support a relatively low diversity of wildlife species, and typically support only those species that are common throughout the Central Valley and occupy a variety of habitats. Common wildlife species that may currently use the project site orchards include American robin (*Turdus migratorius*), the nonnative European starling (*Sturnus vulgaris*), gopher snake (*Pituophis catenifer*), western gray squirrel (*Sciurus griseus*), and the nonnative black rat (*Rattus rattus*).

Remnant native riparian habitats, primarily mixed riparian forest, occur to the west of the Nicolaus property and south of the Singh Unit. These habitats are expected to support a variety of breeding bird species, which have been documented in BSRSP and nearby areas (PRBO 2002, Manolis 1998). Breeding territories of 24 riparian bird species have been documented in and adjacent to the Capay unit of the Sacramento River National Wildlife Refuge, which is located directly across the Sacramento River from the Singh and Nicolaus properties (Gilchrist et al. 2002). Among the more common of these species are black phoebe (*Sayornis nigricans*), western wood-pewee (*Contopus sordidulus*), black headed grosbeak (*Pheucticus melanocephalus*), and spotted towhee (*Pipilo maculatus*). The riparian habitats adjacent to the project site are also expected to support common reptiles and amphibians, such as Pacific chorus frog (*Pseudacris regilla*) and common garter snake (*Thamnophis sirtalis*); and common mammals, such as western gray squirrel (*Sciurus griseus*) and raccoon (*Procyon lotor*).

The project site is also bounded by aquatic habitat and a small amount of freshwater marsh, with Mud Creek forming the eastern border of both properties and the Sacramento River forming the west border of the Singh Unit. These waterways are known to be inhabited by belted kingfisher (*Ceryle alcyon*), mallard (*Anas platyrhynchos*), American beaver (*Castor canadensis*), common muskrat (*Ondatra zibethicus*), and the nonnative bullfrog (*Rana catesbiana*), all of which are expected to occur near the project site.

Orchards and row crops also border the project site, to the north and south of the Nicolaus property and to the north of the Singh Unit. Wildlife common to nearby row crop habitats include killdeer (*Charadrius vociferous*), red-tailed hawk (*Buteo jamaicensis*), house finch (*Carpodacus mexicanus*), western fence lizard (*Sceloporus occidentalis*), desert cottontail (*Sylvilagus audubonii*), and California vole (*Microtus californicus*).

## FISHERIES

The Sacramento River provides vital fish spawning, rearing, and/or migratory habitat for a diverse assemblage of native and introduced fish species. Native species include both anadromous (i.e., species that spawn in freshwater after migrating as adults from marine habitat), and resident species. Native anadromous species that occur in the Sacramento River include four runs of chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*), green and white sturgeon (*Acipenser medirostris* and *A. transmontanus*), and pacific lamprey (*Lampetra tridentata*). Native resident species include Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento splittail (*Pogonichthys macrolepidotus*), Sacramento sucker (*Catostomus occidentalis*), hardhead (*Mylopharodon conocephalus*), and rainbow trout (*Oncorhynchus mykiss*). Introduced anadromous species include striped bass (*Morone saxatilis*) and American shad (*Alosa sapidissima*). Introduced resident species include largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), white and black crappie (*Pomoxis annularis* and *nigromaculatus*), channel catfish (*Ictalurus punctatus*), white catfish (*Ameiurus catus*), brown bullhead

(*Ictalurus nebulosus*), bluegill (*Lepomis macrochirus*), green sunfish (*Lepomis cyanellus*), golden shiner (*Notemigonus crysoleucas*), and brown trout (*Salmo trutta*).

Mud Creek, which flows adjacent to the project area before entering Big Chico Creek and, later, the Sacramento River, supports native and nonnative warmwater fish species including many mentioned above. Mud Creek originates at approximately 3,800 feet in elevation in the foothills before flowing approximately 26 miles to join Big Chico Creek. Flows in Mud Creek become extremely low in late summer, which may exclude the presence of many native species including salmon and trout.

Big Chico Creek originates at about 6,000 feet on Colby Mountain and flows for 45 miles to its confluence with the Sacramento River. It supports trout and salmon runs, mainly in mountainous upstream reaches. Similar to Mud Creek, flows in Big Chico Creek become very low as days grow warmer in late summer. Both creeks are bordered by agricultural lands that are protected by levees or earthen berms.

Shaded riverine aquatic vegetation and instream tree and shrub debris provide important fish habitat. Shaded riverine aquatic habitat is defined as the nearshore aquatic habitat occurring at the interface between a river and adjacent woody riparian habitat. The principal attributes of this cover type are: (1) an adjacent bank composed of natural, eroding substrates supporting riparian vegetation that either overhang or protrude into the water; and (2) water that contains variable amounts of woody debris, such as leaves, logs, branches, and roots and has variable depths, velocities, and currents. Riparian habitat provides structure (through shaded riverine aquatic habitat) and food for fish species. Shade decreases water temperatures, while low overhanging branches can provide sources of food by attracting terrestrial insects. As riparian areas mature, the vegetation sloughs off into the rivers, creating structurally complex habitat consisting of large woody debris that furnishes refugia from predators, creates higher water velocities, and provides habitat for aquatic invertebrates. For these reasons, many fish species are attracted to shaded riverine aquatic habitat.

The use of different areas within the project area by fish species is influenced by variations in habitat conditions, each species' habitat requirements, life history timing, and daily and seasonal movements and behavior. Altered flow regimes, flood control, and bank protection efforts along much of the Sacramento River have reduced sediment transport, channel migration and avulsion, large woody debris recruitment, and have isolated the channel from its floodplain in many reaches. Historically, seasonal flooding covered extensive floodplains and provided spawning and rearing habitat for many fish species, including Sacramento splittail and juvenile chinook salmon and steelhead. Flooded areas are highly productive rearing habitats in which young fish tend to grow very rapidly (Jones & Stokes 1999). Levee construction and channel confinement have caused a reduction in the overall amount of seasonal flooding and shallow water habitat in the Sacramento River system. In the winter and spring of wet years, however, some agricultural fields are allowed to flood (e.g., Butte Basin, Yolo Bypass, and Sutter Bypass) during heavy storms and are used by splittail for spawning and rearing, and by chinook salmon and steelhead for rearing.

## **SENSITIVE BIOLOGICAL RESOURCES**

Sensitive biological resources addressed in the following sections include those that are afforded special protection through the California Environmental Quality Act (CEQA), the federal Endangered Species Act (ESA), the California Endangered Species Act (CESA), the California Fish and Game Code, and the federal Clean Water Act (CWA).

### **Special-status Species**

Special-status species include plants and animals that are legally protected or are otherwise considered sensitive by federal, state, or local resource conservation agencies and organizations. Special-status species addressed in this section include:

- ▶ Species listed or proposed for listing as threatened or endangered under ESA or CESA
- ▶ Species considered as candidates for listing as threatened or endangered under ESA or CESA
- ▶ Species identified by the California Department of Fish and Game (DFG) as California Species of Special Concern
- ▶ Animals fully protected in California under the California Fish and Game Code
- ▶ Plants listed as Endangered or Rare under the California Native Plant Protection Act
- ▶ Plants designated by the California Native Plant Society (CNPS) as List 1B (plants rare, threatened or endangered in California and elsewhere) or List 2 (plants rare, threatened or endangered in California but more common elsewhere)
- ▶ CALFED Bay–Delta Program Multi-Species Conservation Strategy Goals

An evaluation of special-status species with potential to occur on and adjacent to the project area was conducted, based on searches of the DFG’s California Natural Diversity Database (CNDDB) (2007) and the CNPS Electronic Inventory of Rare and Endangered Plants of California (CNPS 2007), review of existing biological resource documents, and a reconnaissance survey on September 27, 2007. CNDDB and CNPS inventory and searches were conducted for the Ord Ferry, Hamilton City, Chico, Glenn, Llano Seco, Nelson, Foster Island, Nord, and Richardson Springs USGS 7.5-minute quadrangles. Exhibit 4.4-2 shows the location of special-status species that occur in the vicinity of the project area.

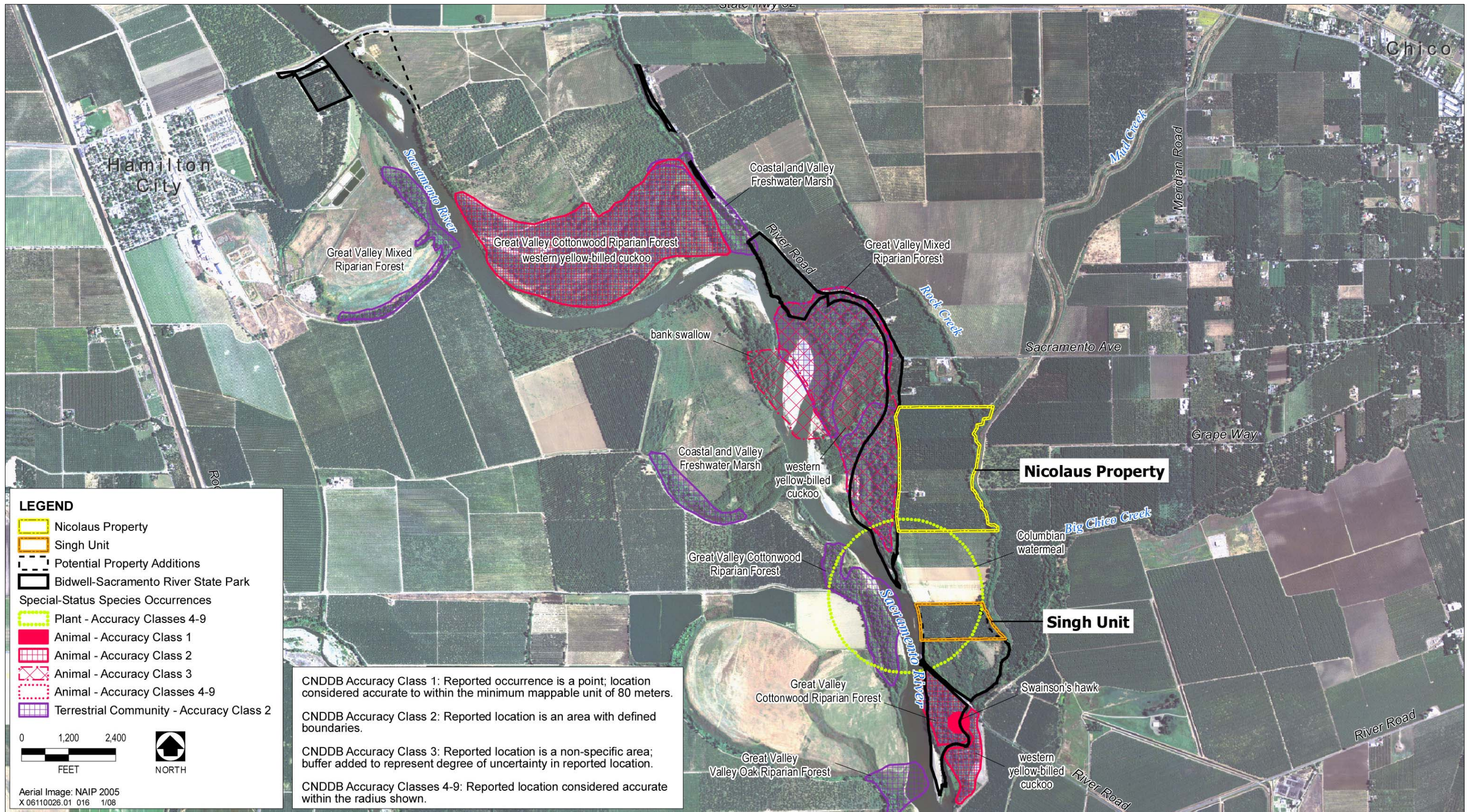
### **Special-status Plants**

Existing habitat within the project area is limited to agricultural lands that are currently under cultivation and are consequently not expected to provide suitable habitat for special status plant species. Table 4.4-2 provides information on special-status plants that are known from the vicinity of the project area and that have potential to occur in the riparian habitats adjacent to the existing orchards that characterize the project area. Information regarding each species’ regulatory status, habitat requirements, and blooming period is also provided in the table.

Seventeen species in the database searches are known to occur in the nine quadrangle area surrounding the project area, but were eliminated from the table and from further review because the project area does not contain suitable habitat or they do not typically occur in the project area elevation range. These species are Ferris’s milkvetch (*Astragalus tener* var. *ferrisiae*), round-leaved filaree (*California macrophylla*), pink creamsacs (*Castilleja rubicundula* ssp. *rubicundula*), Hoover’s spurge (*Chamaesyce hooveri*), white-stemmed clarkia (*Clarkia gracilis* ssp. *albicaulis*), recurved larkspur (*Delphinium recurvatum*), Butte County fritillary (*Fritillaria eastwoodiae*), adobe-lily (*Fritillaria pluriflora*), Red Bluff dwarf rush (*Juncus leiospermus* var. *leiospermus*), Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*), veiny monardella (*Monardella douglasii* ssp. *venosa*), Ahart’s paronychia (*Paronychia ahartii*), Butte County checkerbloom (*Sidalcea robusta*), and flagella-like atractyllocarpus (*Atractyllocarpus flagellaceous*).

As listed in Table 4.4-2, seven special-status plant species—fox sedge (*Carex vulpinoidea*), silky cryptantha (*Cryptantha crinita*), four-angled spike rush (*Eleocharis quadrangulata*), rose-mallow (*Hibiscus lasiocarpus*), California beaked-rush (*Rhynchospora californica*), Sanford’s sagittaria (*Sagittaria sandfordii*), and Columbian watermeal (*Wolffia brasiliensis*)—have moderate to low potential to occur in freshwater marsh or riparian habitat adjacent to the eastern, southern, and western edges of the project area. However, the extent and quality of freshwater marsh habitat directly adjacent to the project area is low and limits the potential for the plants’ occurrence.





Source: DFG 2003, GIC 2003, DPR 2003, and NAIP 2005

Location of Special-Status Species in the Vicinity of the Project Area

Exhibit 4.4-2



**Table 4.4-2  
Special-status Plants with Potential to Occur Adjacent to the Project Area**

Species	Status <sup>1</sup>				Habitat and Blooming Period	Potential for Occurrence <sup>2</sup>
	Federal	State	CNPS	MSCS Goals <sup>3</sup>		
Plants						
Fox sedge <i>Carex vulpinoidea</i>	—	—	2	—	Freshwater marshes and swamps, riparian woodland Blooms May–June	Could occur; suitable freshwater marsh and riparian woodland habitat is present adjacent to the project area.
Silky cryptantha <i>Cryptantha crinita</i>	—	—	1B	m	Gravelly streambeds within cismontane woodland, lower montane coniferous forest, riparian scrub, riparian woodland, and valley and foothill grassland Blooms April–May	Unlikely to occur; suitable gravelly streambeds occur well outside of the project area.
Four-angled spike rush <i>Eleocharis quadrangulata</i>	—	—	2	m	Freshwater marshes and swamps Blooms May–September	Could occur; suitable freshwater marsh is present adjacent to the project area.
Rose-mallow <i>Hibiscus lasiocarpus</i>	—	—	2	m	Freshwater marshes and swamps Blooms June–September	Could occur; suitable freshwater marsh is present adjacent to the project area.
California beaked-rush <i>Rhynchospora californica</i>	—	—	1B	m	Bogs and fens, lower montane coniferous forest, freshwater marshes and swamps Blooms May–July	Could occur; suitable freshwater marsh is present adjacent to the project area.
Sanford’s sagittaria <i>Sagittaria sanfordii</i>	—	—	1B	—	Shallow freshwater marshes and swamps Blooms May–October	Could occur; suitable freshwater marsh is present adjacent to the project area.
Columbian watermeal <i>Wolffia brasiliensis</i>	—	—	2	—	Assorted shallow freshwater marshes and swamps Blooms in April–December	Could occur: A historic population is known from the area around Chico Landing boat ramp in BSRSP.

<sup>1</sup> **Legal Status Definitions**

CNPS Categories

1B Plant species considered rare or endangered in California and elsewhere

2 Plant species considered rare or endangered in California but more common elsewhere

<sup>2</sup> **Potential for Occurrence Definitions**

Unlikely to occur: Suitable habitat is available on or adjacent to the project area; however, the amount of habitat is limited.

Could occur: Suitable habitat is available on or adjacent to the project area; however, there are little to no other indicators that the species is present.

<sup>3</sup> **Multi-Species Conservation Strategy Goals**

R Recovery. Recover species’ populations within the MSCS focus area to levels that ensure the species’ long-term survival in nature.

r Contribute to recovery. Implement some of the actions deemed necessary to recover species’ populations within the MSCS focus area.

m Maintain. Ensure that any adverse effects on the species that could be associated with implementation of CALFED actions will be fully offset through implementation of actions beneficial to the species (CALFED Bay–Delta Program 2000).



## Fox Sedge

Fox sedge (*Carex vulpinoidea*) is a perennial herb in the sedge family (Cyperaceae). It is a CNPS List 2 species. This species produces small, inconspicuous flowers from May to June. Suitable habitat consists of riparian woodland and freshwater marshes and swamps. Fox sedge has been reported not far from the project area, east of the Sacramento River, just north of Golden State Island and between lower Foster Island and the southern end of Dicus Slough (CNDDDB 2007).

## Silky Cryptantha

Silky cryptantha (*Cryptantha crinita*) is an annual herb in the Borage family (Boraginaceae). It is a CNPS List 1B species, and produces small, inconspicuous white flowers from April to May. The plant is found on gravelly streambeds within lower montane coniferous forest, cismontane woodland, riparian scrub, riparian woodland, and valley and foothill grassland habitats.

## Four-angled Spikerush

Four-angled spikerush (*Eleocharis quadrangulata*) is also a CNPS List 2 species and member of the sedge family. As its common name suggests, the stem of this perennial herb is strongly four-sided. It blooms from May to September and grows in freshwater marshes and swamps as well as along pond and lake margins.

## Rose-mallow

Rose-mallow (*Hibiscus lasiocarpus*) is an emergent perennial herb in the mallow family (Malvaceae) that produces large white or pink flowers. This CNPS List 2 species blooms from June to September and grows in freshwater marshes and swamps. Rose-mallow has been reported to occur in an oxbow north of Golden State Island and east of the Sacramento River, within the area covered by the Park Plan (CNDDDB 2007).

## California Beaked Rush

California beaked rush (*Rhynchospora californica*), a member of the Rush family (Juncaceae), is a CNPS List 1B plant. It is a medium sized clumping rush with clustered heads of reddish-brownish lowers subtended by a distinctive awn-like bract. California beaked rush can be found in bogs, fens, freshwater marshes and swamps.

## Sanford's Sagittaria

Sanford's sagittaria (*Sagittaria sanfordii*) is a CNPS List 1B species in the water-plantain family (Alismataceae). This emergent perennial herb produces white flowers from May to October. Unlike other sagittaria species, it does not have arrow-shaped leaves. Suitable habitat typically consists of shallow, standing fresh water associated with marshes and swamps. Sanford's sagittaria can also occur within slow-moving water bodies such as ponds, lakes, sloughs, ditches, canals, streams, and rivers.

## Columbian Watermeal

Columbian watermeal (*Wolffia brasiliensis*) is a CNPS List 2 species in the duckweed family (Lemnaceae). It is a perennial aquatic herb that produces inconspicuous flowers from April to December. Columbian watermeal produces a transparent green, spheric plant body that is less than 1.5 mm. This species grows in colonies on the water surface within shallow freshwater marshes. Columbian watermeal has been reported within the BSRSP, in the sloughs near Chico Landing (CNDDDB 2007).



## Special-status Wildlife

Table 4.4-3 provides information on special-status wildlife species with potential to occur on or adjacent to the project site, including the species' regulatory status, habitat requirements, CALFED MSCS conservation goals, and an assessment of their potential for occurrence. As described above, existing habitat within the project site is limited to walnut and almond orchards, and does not provide suitable nesting habitat for any of the special-status wildlife described. Eleven special-status wildlife species have potential to nest in suitable habitats adjacent to the project site. An additional nine special-status species have potential to forage adjacent to the project site. Four of these species may also forage occasionally in the project site orchards, but are more strongly associated with riparian forest habitats.

Table 4.4-3 Special-status Wildlife with Potential to Occur In or Adjacent to the Project Area					
Species	Status <sup>1</sup>			Habitat	Potential for Occurrence <sup>2</sup>
	Federal	State	MSCS Goals <sup>3</sup>		
<b>Invertebrates</b>					
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T	—	R	Elderberry shrubs, typically in riparian habitats	Could occur; elderberry shrubs present in riparian habitats adjacent to the project area.
<b>Reptiles</b>					
Giant garter snake <i>Thamnophis gigas</i>	T	T	r	Slow-moving streams, sloughs, ponds, marshes, inundated floodplains, rice fields, and irrigation and drainage ditches	Unlikely to occur; Mud Creek adjacent to the project site offers potentially suitable habitat; however, giant garter snakes have not been recorded between the levees of the Sacramento River floodplain and uplands on the project site are unsuitable due to ongoing agricultural cultivation.
Northwestern pond turtle <i>Actinemys marmorata marmorata</i>	—	SSC	m	Ponds, marshes, rivers, streams, sloughs	Known to occur; suitable aquatic habitat in Mud Creek adjacent to the project site.
<b>Birds</b>					
American white pelican <i>Pelecanus erythrorhynchos</i>	—	SSC	—	Marshes, rivers, and other aquatic habitats	Known to occur; suitable foraging habitat in Sacramento River adjacent to the project site; however, sites not within species breeding range.
Double-crested cormorant <i>Phalacrocorax auritus</i>	—	SSC	m	Isolated islets or tall lakeside trees near fish-bearing waters	Known to occur; suitable foraging habitat in Sacramento River adjacent to the project site; however, no nesting colonies are expected to occur nearby.
Osprey <i>Pandion haliaetus</i>	—	SSC	m	Coastal habitats, freshwater lakes and reservoirs, and large rivers	Known to occur; suitable foraging habitat in Sacramento River adjacent to the project site; could nest in large trees adjacent to project site.
Southern bald eagle <i>Haliaeetus leucocephalus leucocephalus</i>	—	E, FP	m	Large rivers, freshwater lakes and reservoirs, and marshes	Known to occur; suitable foraging habitat in Sacramento River adjacent to the project site; however, sites not within species breeding range.



<b>Table 4.4-3</b> <b>Special-status Wildlife with Potential to Occur In or Adjacent to the Project Area</b>					
Species	Status <sup>1</sup>			Habitat	Potential for Occurrence <sup>2</sup>
	Federal	State	MSCS Goals <sup>3</sup>		
White-tailed kite <i>Elanus leucurus</i>	—	FP	m	Forage in grasslands and agricultural fields; nest in isolated trees or small woodland patches	Known to occur; suitable foraging habitat in row crop fields adjacent to project site; suitable nesting habitat in adjacent riparian forest.
Northern harrier <i>Circus cyaneus</i>	—	SSC	m	Forage and nest in grasslands, agricultural fields, and marshes	Known to occur; suitable foraging habitat in marsh and row crop fields adjacent to project site; however, unlikely to nest on or adjacent to project site.
Cooper's hawk <i>Accipiter cooperii</i>	—	SSC	m	Forage and nest in open woodlands and woodland margins	Known to occur; suitable foraging and nesting habitat in riparian forest adjacent to project site.
Sharp-shinned hawk <i>Accipiter striatus</i>	—	SSC	—	Forage and nest in open woodlands and woodland margins	Known to occur; suitable foraging habitat in riparian forest adjacent to project site; however, sites not within species breeding range.
Swainson's hawk <i>Buteo swainsoni</i>	—	T	R	Forage in grasslands and agricultural fields; nest in open woodland or scattered trees	Known to occur; suitable foraging habitat in row crop fields adjacent to project site; suitable nesting habitat in adjacent riparian forest.
Burrowing owl <i>Athene cunicularia</i>	—	SSC	—	Grasslands and agricultural fields, especially where ground squirrel burrows are present	Unlikely to occur; suitable foraging and nesting habitat in row crop fields adjacent to project site; however, has not been documented on or adjacent to the project site, and ground squirrel colonies are not present.
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	C	E	R	Riparian forest, typically with mature cottonwoods and willows	Known to occur; suitable foraging and nesting habitat in riparian forest adjacent to project site; nesting has been documented by CNDDB directly across the Sacramento River from project site.
Bank swallow <i>Riparia riparia</i>	—	T	R	Forage in various habitats; nests in banks or bluffs, typically adjacent to water	Known to occur; suitable aerial foraging habitat present throughout the project area; nesting colonies documented by CNDDB across Sacramento River from project site.
Little willow flycatcher <i>Empidonax traillii brewsteri</i>	—	E	—	Riparian woodland and scrub; typically nests in willow and alder patches	Known to occur; suitable foraging habitat in riparian forest and scrub adjacent to project site; however, not within species breeding range.
Loggerhead shrike <i>Lanius ludovicianus</i>	—	SSC	—	Forage in grasslands, and agricultural fields; nest in scattered shrubs and trees	Known to occur; suitable foraging habitat provided by row crop fields adjacent to project site; nesting habitat provided by adjacent riparian habitat.

Table 4.4-3 Special-status Wildlife with Potential to Occur In or Adjacent to the Project Area					
Species	Status <sup>1</sup>			Habitat	Potential for Occurrence <sup>2</sup>
	Federal	State	MSCS Goals <sup>3</sup>		
Yellow warbler <i>Dendroica petechia</i>	—	SSC	—	Riparian woodland and scrub	Known to occur; suitable foraging and nesting habitat in riparian forest adjacent to project site; nesting has been documented nearby at Capay.
Yellow-breasted chat <i>Icteria virens</i>	—	SSC	m	Riparian woodland and scrub, with dense shrub cover	Known to occur; suitable foraging and nesting habitat in riparian forest adjacent to project site; nesting has been documented nearby at Capay.
<b>Mammals</b>					
Ringtail <i>Bassariscus astutus</i>	—	FP	—	Riparian forest and shrubland	Could occur; suitable foraging and nesting habitat in riparian forest adjacent to project site.
<sup>1</sup> <b>Legal Status Definitions</b> <u>Federal</u> E Endangered T Threatened C Candidate for Listing  <u>State</u> E Endangered T Threatened FP Fully Protected SSC Species of Special Concern					
<sup>2</sup> <b>Potential for Occurrence Definitions</b> <u>Unlikely to occur</u> : Habitat on or adjacent to the project site is generally suitable; however, the species is not known to occur in the vicinity and is not expected to occur due to one or more important habitat factors. <u>Could occur</u> : Suitable habitat is available on or adjacent to the project site; however, the species has not been documented on or adjacent to the project site. <u>Known to occur</u> : The species was reported in a TNC Site Assessment as having been observed within 5 miles of the project site and within the Sacramento River levees (Hubbell et al. 2003a and 2003b).					
<sup>3</sup> <b>Multi-Species Conservation Strategy Goals</b> R Recovery. Recover species' populations within the MSCS focus area to levels that ensure the species' long-term survival in nature. r Contribute to recovery. Implement some of the actions deemed necessary to recover species' populations within the MSCS focus area. m Maintain. Ensure that any adverse effects on the species that could be associated with implementation of CALFED actions will be fully offset through implementation of actions beneficial to the species (CALFED Bay-Delta Program 2000).					

## Special-status Invertebrates

Valley elderberry longhorn beetles require elderberry shrubs for reproduction and survival, spending most of their life cycle as larvae within the stems. The larval stage may last 2 years, after which the larvae enter the pupal stage and transform into adults. Adults are active (feeding and mating) from March to June (USFWS 1984). Valley elderberry longhorn beetles are patchily distributed throughout riparian forests of the Central Valley, although they appear to be only locally common (i.e., found in population clusters that are not evenly distributed across the Central Valley) (USFWS 1984). Elderberry shrubs are likely to occur in riparian habitats adjacent to the project site; therefore, valley elderberry longhorn beetles could also occur in these locations.

During site reconnaissance surveys conducted by EDAW in September 2007, no elderberry shrubs were observed on the project site. However, the riparian habitats adjacent to the project site have potential to support elderberry shrubs, and elderberry shrubs with stems measuring 1.0 inch or greater in diameter when measured at ground level have the potential to harbor valley elderberry longhorn beetle larvae (USFWS 1999a). Elderberry is a fast-growing species, and seedlings may reach 1-inch diameters in as little as 1–2 years under ideal conditions, or more commonly after 2–3 years (Holyoak and Talley, pers. comm., 2007). Elderberry shrubs may thus become established in the project site' adjacent riparian habitat between the time of EDAW's September 2007 reconnaissance survey and future construction of the proposed project, if approved.



The U.S. Fish and Wildlife Service (USFWS) has recently proposed to delist valley elderberry longhorn beetles from their current protected status under the ESA, due in part to the success of past riparian habitat restoration projects (USFWS 2006). The final ruling of whether or not to delist this species will take place after substantial data review, public comment, and potential litigation, and will likely take more than a year to complete.

### Special-status Reptiles

Giant garter snakes inhabit a variety of aquatic habitats, such as marshes, sloughs, ponds, flooded rice fields, irrigation canals and drainage ditches, and inundated floodplains. They are typically absent from large or swift-moving rivers, heavily wooded riparian habitats, and from wetlands with sand, gravel, or rock substrates (USFWS 1999a). These snakes also require adjacent upland habitat for basking and burrows that provide sufficient cover and are at high enough elevations to function as refuges from flood waters during the snakes' inactive season (October–May). The project site is within the geographic range of this species. Although the majority of giant garter snakes occur much farther south in the Sacramento Valley, rare occurrences of this species have been documented in the vicinity of Chico, both in the 1970s (USFWS 1999b) and recently at the oxidation ponds adjacent to the Chico Wastewater Treatment Plant (Fitzgerald, pers. comm., 2005). The project site is within approximately 5 miles of these ponds, and home ranges of individual giant garter snakes have been recorded up to 3 square miles in size (Wylie and Casazza 2000). In a single day, individual giant garter snakes have been recorded traveling over one mile, and may move as much as two miles in a day (Hansen and Brode 1993). Although the Sacramento River, riparian forest habitats, orchards, and row crop fields adjacent to the project site does not provide suitable habitat for giant garter snakes, Mud Creek could offer suitable habitat for this species. However, giant garter snakes are unlikely to occur in any habitat between the flood control levees of the Sacramento River, due to the high flows in winter (Hansen, pers. comm., 2006). Because they depend on year-round habitat suitability, these snakes generally do not occupy otherwise suitable habitat that is located within flood control levees, even during their summer active season when flows are lower. This trend has been observed throughout the Central Valley (Hansen, pers. comm., 2006). In addition, giant garter snakes are unlikely to occur on the project site, because it is actively cultivated and does not provide suitable upland habitat.

Northwestern pond turtles generally occur in streams, ponds, freshwater marshes, and lakes. They require still or slow moving water with emergent woody debris, rocks, or other similar features for basking sites. Nests are typically located on unshaded upland slopes in dry substrates with clay or silt soils. Northwestern pond turtles could occur in the slow-moving aquatic habitat of Mud Creek, adjacent to the project site. They are unlikely to occur in the Sacramento River, which is generally fast-moving and unlikely to provide suitable habitat. Upland habitats on and adjacent to the project site are unlikely to be suitable for nesting, because of the long agricultural history of ground disturbance in the orchard and row crop sites, and the heavy shade of the riparian forest.

### Special-status Birds

Aquatic habitats adjacent to the project site provide suitable foraging habitat for American white pelicans and double-crested cormorants. Double-crested cormorants also have limited potential to nest in trees and snags in less disturbed locations along the Sacramento River and adjacent areas, though no known nesting colonies are present. The project site is not within the known breeding range of the American white pelican.

Osprey and southern bald eagles nest along the shores of large rivers and lakes and prey primarily on fish in such water bodies. Osprey are known to nest at BSRSP (Elliott, pers. comm., 2002) and directly across the Sacramento River from the project site, adjacent to the Sacramento River National Wildlife Refuge's Capay Unit (Gilchrist et al. 2002). Bald eagles do not nest in the Central Valley, but wintering, migrating, and non-breeding individuals are known to occur along the Sacramento River and could forage and roost adjacent to the project site.

Swainson's hawks and white-tailed kites typically nest in scattered riparian or woodland trees adjacent to grasslands and/or row crop fields that provide suitable foraging habitat. Swainson's hawks are known to nest at BSRSP, and have been recorded one mile south of the project site (Exhibit 4.4-2) (CNDDDB 2007). The riparian forest adjacent to the project site provides potential nesting habitat for both Swainson's hawks and white-tailed kites, and the row crop fields adjacent to the project site provide suitable foraging habitat for both species.

Northern harriers and burrowing owls nest and forage in grasslands and row crop fields; northern harriers also nest and forage in marsh habitats. Both species have potential to occur in the row crop fields adjacent to the project site. Burrowing owl, however, is unlikely to occur because this species has not been documented during the several years of bird surveys conducted in the vicinity, and because of the area's extensive agricultural pest control activities which have precluded the establishment of ground squirrel colonies on or adjacent to the project site. It is considered very unlikely that burrowing owl will occur in the project vicinity (Joe Silveira, pers. comm., 2005).

Cooper's hawks and sharp-shinned hawks nest and forage primarily in riparian forest habitats. Cooper's hawks have potential to nest and forage in such habitats adjacent to the project site. Sharp-shinned hawks are not known to nest in the Central Valley, but wintering, migrating, and non-breeding individuals are known to occur along the Sacramento River and could forage and roost adjacent to the project site.

Yellow-billed cuckoos require large blocks (greater than 40 hectares) of riparian forest vegetation for nesting (Laymon et al. 1997). Historically, this species was common and widespread in river bottom riparian habitat throughout California, but numbers have declined dramatically as a result of habitat loss. Cuckoos have recently been documented nesting at Phelan Island, less than two miles south of the project site (Small et al. 2000), and they were detected at BSRSP, within one mile of the project site, in 1998 (Manolis 1998) and 2002 (Gilchrist et al. 2002). Nests have also been recorded in riparian forest habitats directly across the river from the project site, less than two miles north of the project site, and less than one mile south of the project site (Exhibit 4.4-2) (CNDDB 2007). Western yellow-billed cuckoos are not currently known to nest in the riparian habitat directly adjacent to the project site, although there is potential for them to do so.

Bank swallows nest colonially in vertical banks and cliffs with fine-textured sandy soils and tend to return to these colonial nests year after year. Foraging occurs primarily over open riparian areas, but also over grassland, shrubland, and savannah habitats during the breeding season. Historically, bank swallows nested on coastal bluffs in southern California and in riverbanks throughout the Central Valley and northern California, but the current nesting population is concentrated on the banks of Central Valley rivers. Approximately 75% of the current breeding population occurs along banks of the Sacramento and Feather rivers (City of Sacramento et al. 2003). Nesting colonies are present in the Sacramento River bank across from the project site (Exhibit 4.4-2) (CNDDB 2007).

Willow flycatchers have been eliminated from much of their former range in California, and breeding populations in northern California are now primarily restricted to montane meadows in the Sierra Nevada. This species nests in shrubby riparian vegetation, typically in areas with at least some surface water (Bombay et al. 2000). Willow flycatchers are likely to occur in riparian habitat adjacent to the project site during migration, but they are not expected to nest there.

Loggerhead shrike, yellow warbler, and yellow-breasted chat are known to occur in the vicinity of the project site. Loggerhead shrikes occur in open areas and use scattered shrubs and trees for nesting. They are likely to nest and forage in open habitats near the project site, and may also nest along the ecotone between the riparian forest and row crop fields adjacent to the project site (Gilchrist et al. 2002). Yellow warblers typically nest in willow thickets, and yellow-breasted chats typically nest in riparian habitats with a dense shrub layer. Yellow warblers are relatively uncommon breeders in the Central Valley, but a breeding territory has been documented at BSRSP (Manolis 1998), and a breeding pair was recorded nesting in riparian habitat across the Sacramento River from the project site in 1999, adjacent to the Sacramento River National Wildlife Refuge's Capay Unit (TNC 1999). Yellow-breasted chats are also known to breed in riparian habitat adjacent to the Capay Unit and are likely to nest in such habitats adjacent to the project site (Gilchrist et al. 2002).

### Special-status Mammals

Ringtails occur in mixed riparian and other forest and shrubby habitats, in close association with permanent water and rocky areas. They nest in rock crevices, hollow trees, logs, snags, abandoned burrows, or woodrat nests, with young typically born in May and June (DFG 1983). The riparian forest adjacent to the project site provides



suitable habitat for ringtails. Undocumented occurrences of ringtails have been noted emerging from nest trees in the oak woodland near the current office complex and service yard of the BSRSP at the Indian Fishery Unit, adjacent to the Nicolaus parcel.

### Special-status Fish

Table 4.4-4 provides information on special-status fish species known to occur in the Sacramento River, including the species' regulatory status and habitat description. A total of seven special-status fish species are known to occur adjacent to the project area during at least a portion of their life cycles. In some cases, it is an evolutionarily significant unit (ESU) of a fish species, rather than the entire population, that is listed as special-status. (An ESU is a distinctive group of Pacific salmon. ESU is further described below.) Special-status fish species occurring in the vicinity of the proposed project include Central Valley fall-/late-fall-run chinook salmon, Sacramento River winter run chinook salmon, Central Valley spring run chinook salmon, steelhead, green sturgeon, Sacramento splittail, and hardhead. Most of these species are anadromous and spend various life stages in the project area. These species may only be present near the project site during certain times of year, described in the text following Table 4.4-4. The only exceptions are splittail and hardhead, which are resident species. Table 4.4-4 also identifies goals for certain species evaluated as part of the CALFED MSCS.

<b>Table 4.4-4</b> <b>Special-status Fish with Potential to Occur Adjacent to the Project Area</b>				
Species	Status <sup>1</sup>			Habitat
	Federal	State	MSCS Goals <sup>2</sup>	
Chinook salmon – Sacramento River winter-run <i>Oncorhynchus tshawytscha</i>	E	E	R	Rivers and streams, including the Sacramento River.
Chinook salmon - Central Valley spring-run <i>Oncorhynchus tshawytscha</i>	T	T	R	Rivers and streams, including the Sacramento River.
Chinook salmon - Central Valley fall-/late fall-run <i>Oncorhynchus tshawytscha</i>	—	SSC	R	Rivers and streams, including the Sacramento River.
Central Valley steelhead <i>Oncorhynchus mykiss</i>	T	—	R	Rivers and streams, including the Sacramento River.
Green sturgeon <i>Acipenser medirostris</i>	T	—	R	Bay-Delta and associated large rivers, including the Sacramento River.
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	—	SSC	R	Bay-Delta and associated rivers and streams, including the Sacramento River.
Hardhead <i>Mylopharodon conocephalus</i>	—	SSC	m	Rivers and streams, including the Sacramento River.
<sup>1</sup> <b>Legal Status Definitions</b> <div> <div> <b>Federal</b>  E Endangered  T Threatened  C Candidate for listing </div> <div> <b>State</b>  E Endangered  T Threatened  SSC Species of Special Concern </div> </div>				
<sup>2</sup> <b>Multi-Species Conservation Strategy Goals</b> R Recovery. Recover species' populations within the MSCS focus area to levels that ensure the species' long-term survival in nature. r Contribute to recovery. Implement some of the actions deemed necessary to recover species' populations within the MSCS focus area. m Maintain. Ensure that any adverse effects on the species that could be associated with implementation of CALFED actions will be fully offset through implementation of actions beneficial to the species (CALFED Bay-Delta Program 2000).				

## Chinook Salmon

Four runs of chinook salmon occur in the Sacramento River, including fall-, late fall-, winter-, and spring-run. The distribution and abundance of each run is limited by the availability of suitable habitat during their respective spawning seasons. Chinook salmon use this portion of the Sacramento River as a migratory pathway for adults and as rearing habitat for emigrating juveniles. Fall-run chinook salmon is the most abundant ESU, documented to comprise about 80% of the Sacramento Basin stock in the early 1980s (Kjelson et al. 1982). Under ESA, an ESU is considered a population (or group of populations) that is reproductively isolated from other populations of the same species and that contributes substantially to the ecological/genetic diversity of the species (Waples 1991). Different runs of the same salmon species are often considered separate ESUs because the populations are reproductively isolated due to different spawning times. The portion of the Sacramento River adjacent to the project site (along with other areas) is designated as critical habitat for winter-run and spring-run chinook salmon. Critical habitat includes the river water, river bottom, and adjacent riparian zone (i.e., those adjacent terrestrial areas that directly affect a freshwater aquatic ecosystem).

All chinook salmon require cold, freshwater streams with suitable gravel for reproduction. Females deposit their eggs in nests, or “redds,” which they excavate in the gravel bottom in areas of relatively swift water (Moyle 2002). For maximum survival of incubating eggs and larvae, water temperatures must be between 39°F and 57°F. After emerging, chinook salmon fry tend to seek shallow, nearshore habitat with slow water velocities and move to progressively deeper, faster water as they grow (DFG 1998). Freshwater rearing habitat extends from upstream spawning reaches to the Bay-Delta and Suisun Bay (USFWS 1997). Juveniles typically rear in fresh water for up to 5 months before migrating to sea, although spring-run juveniles frequently reside in freshwater habitat for 12–16 months. Chinook salmon spend 2–4 years maturing in the ocean before returning to their natal streams to spawn. All adult chinook salmon die after spawning.

Winter-run chinook salmon typically migrate by the project area from December through July as adults, and from November through May as emigrating juveniles. Adult spring-run generally migrate by the project area from March to September, while juveniles and yearlings emigrate downstream from March to June and November to April, respectively. Adult fall-run chinook salmon enter the Sacramento River system from July through December and spawn from October through December. Late fall-run chinook salmon enter the river from October to April and spawn from January to April (Vogel and Marine 1992).

Since 1981, USFWS personnel have captured juvenile chinook salmon using beach seines at 13 sampling sites between RM 298 (Redding) and RM 164 (Princeton), including a RM 193 site. USFWS data provides information on presence/absence, timing of migration, and size of juvenile chinook salmon runs. The four different runs of chinook salmon exhibit different rearing strategies that are partially explained by the availability of food, river flows, and water temperatures in the upper and lower river and Bay-Delta area. Generally, fall and spring-run chinook salmon move out of the upper river 1–2 months after emergence, and are hypothesized to rear in the lower river or in the Bay-Delta. A portion of the winter-run chinook salmon migrate out of the upper river soon after emergence; however, the majority appear to rear in the upper river and tributaries (Maslin et al. 1997 and 1998). Late-fall-run chinook salmon tend to reside 4–6 months in the upper river before moving out of the system (USFWS 1992).

Juvenile chinook salmon captured at RM 193 during 1990–1999 follow the above patterns, and their presence at this location suggests they were likely migrating down the river, so occurrences here were temporary and indicate timing of outmigration. Fall-run chinook salmon were the most abundant run captured at RM 193, and occurred in greater numbers during March, which corresponded to a time of high streamflows. Winter-run outmigration peaked during November, a likely response to increasing streamflows due to winter rains. Late-fall run outmigration was bimodal with some moving out as fry in May and the majority as smolts in October. Spring-run outmigration occurred soon after emergence and was also bimodal corresponding to peak streamflows during the winter (rain events) and spring (snowmelt) (USFWS 1992).



## Steelhead

Steelhead use the portion of the Sacramento River adjacent to the project site (along with other areas) as a migratory pathway for adults and as rearing habitat for emigrating juveniles. Historical records indicate that adult steelhead enter the mainstem Sacramento River in July, reach peak abundance in the fall, and continue migrating through February or March (McEwan and Jackson 1996). Juveniles emigrate downstream to the ocean beginning in November and continuing through May (Schaffter 1980), although most Sacramento River steelhead emigrate in spring and early summer. Sacramento River steelhead generally migrate as 1-year-olds (Barnhart 1986, Reynolds et al. 1993). The portion of the Sacramento River adjacent to the project site is designated critical habitat for Central Valley steelhead.

## Green Sturgeon

Green sturgeon has recently has been listed as threatened by NMFS (71 FR 17757). Green sturgeon occur in the lower reaches of large rivers, including the Sacramento–San Joaquin River basin, and in the Eel, Mad, Klamath, and Smith rivers (Moyle et al. 1992). Green sturgeon adults and juveniles occur throughout the upper Sacramento River, based upon observations incidental to winter-run Chinook monitoring at the Red Bluff Diversion Dam in Tehama County (Brown 2006). Green sturgeon spawn predominantly in the upper Sacramento River. They are thought to spawn every 3–5 years. Their spawning period is March to July, with a peak in mid-April to mid-June (Moyle et al. 1992). Juveniles inhabit the estuary until they are approximately 4–6 years old, when they migrate to the ocean (Kohlhorst et al. 1991). Juvenile fish have been collected in the vicinity of the project area, near Hamilton City.

## Sacramento Splittail

Sacramento splittail were historically widely distributed throughout much of the Central Valley, but dams and diversions have prevented them from reaching many upstream reaches, and the current population is concentrated in the Bay-Delta region. Recent data indicate that splittail occur in the Sacramento River as far upstream as the Red Bluff Diversion Dam (RM 240) (Sommer et al. 1997, Maslin et al. 1997), and that some adults spend the summer in the mainstem Sacramento River rather than return to the estuary (Baxter 1999). Several adults were observed in Mud Creek and Kusal Slough in 1996 and 1997 (Maslin et al. 1997). The distribution and extent of spawning and rearing along the mainstem Sacramento River is unknown. Splittail spawn over flooded terrestrial or aquatic vegetation (Moyle 2002, Wang 1986) in early March and May in the lower reaches of the Sacramento River (Moyle et al. 1989). Spawning has been observed as early as January and continues through July (Wang 1986). Larval splittail are commonly found in the shallow, vegetated areas where spawning occurs. Larvae eventually move into deeper open water habitats as they grow and become juveniles. Riparian vegetation in the project area that is prone to sustained flooding provides potential splittail spawning and rearing habitat.

## Hardhead

Hardhead are widely distributed throughout the low- to mid-elevation streams in the main Sacramento–San Joaquin drainage as well as in the Russian River drainage. Hardhead prefer the undisturbed portions of larger streams at low to middle elevations. They are able to withstand summer water temperatures above 68°F; however hardhead will select lower temperatures when they are available. They are fairly intolerant of low-oxygenated waters, particularly at higher water temperatures. Pools with sand-gravel substrates and slow water velocities are the preferred habitat; adult fish inhabit the lower half of the water column, while the juvenile fish remain in the shallow water closer to the stream edges. Hardhead typically feed on small invertebrates and aquatic plants at the bottom of quiet water (Moyle 2002).

## **SENSITIVE HABITATS**

Sensitive habitats include those that are of special concern to resource agencies or that are afforded specific consideration through CEQA, Section 1602 of the California Fish and Game Code, or Section 404 of the federal CWA as discussed further in Section 4.4.2, “Regulatory Setting.” Sensitive habitats are of special concern because they are of high value to plants, wildlife, and fish species and have high potential to support special-status species. Sensitive habitats also provide other important ecological functions, such as enhancing flood and erosion control and maintaining water quality.

There are no sensitive habitats within the project site. A variety of sensitive habitats, including Great Valley willow scrub, Great Valley cottonwood riparian forest, freshwater marsh, and wetlands are present adjacent to the project site. These habitats are protected under the Fish and Game Code and/or federal CWA.

### **4.4.2 REGULATORY SETTING**

Important regulations that protect biological resources and could be applicable to the proposed project are discussed below.

#### **FEDERAL REGULATIONS**

##### **Federal Endangered Species Act**

The USFWS and the National Marine Fisheries Service (NMFS) have authority over projects that may affect the continued existence of a federally-listed (threatened or endangered) species. Section 9 of ESA prohibits the take of federally-listed species; take is defined under ESA, in part, as killing, harming, or harassment. Under federal regulations, take is further defined to include habitat modification or degradation where it actually results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Section 7 of ESA outlines procedures for federal interagency cooperation to conserve federally-listed species and designated critical habitat. Section 7(a)(2) requires federal agencies to consult with USFWS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species. For projects where federal action is not involved and take of a listed species may occur, the project proponent may seek to obtain incidental take under Section 10(a) of ESA. Section 10(a) of ESA allows USFWS to permit the incidental take of listed species if such take is accompanied by a Habitat Conservation Plan (HCP) that includes components to minimize and mitigate impacts associated with the take.

##### **Migratory Bird Treaty Act**

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, provides for international migratory bird protection and authorizes the Secretary of the Interior to regulate the taking of migratory birds. MBTA provides that it shall be unlawful, except as permitted by regulations, to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird. The list of species protected by MBTA has recently been updated by USFWS; the current list can be found in the August 24, 2006 Federal Register (71 FR 50194). The list includes nearly all birds native to the United States. Loss of nonnative species, such as house sparrows, European starlings, and rock pigeons, are not covered by this statute.

##### **Clean Water Act**

Pursuant to Section 404 of the CWA, the USACE regulates discharge of dredge or fill material into waters of the United States. Waters of the United States and their lateral limits are defined in 33 CFR Part 328.3 (a) and include navigable waters of the United States, interstate waters, all other waters where the use or degradation or



destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Fill is defined as any material that replaces any portion of a water of the United States with dry land or changes the bottom elevation of any portion of a water of the United States. Any activity resulting in the placement of dredge or fill material to waters of the United States requires a permit from the USACE. Pursuant to Section 401 of the CWA, projects that apply for a USACE permit for discharge of dredge or fill material must obtain water quality certification from the Regional Board (formerly called RWQCB) indicating that the project would uphold state water quality standards.

### **Magnuson-Stevens Fishery Conservation and Management Act**

The amended Magnuson-Stevens Fishery Conservation and Management Act, also known as the Sustainable Fisheries Act, requires all federal agencies to consult with the Secretary of Commerce on activities or proposed activities authorized, funded, or undertaken that may adversely affect Essential Fish Habitat (EFH) of commercially managed marine and anadromous fish species (Office of Habitat Conservation 1999). The EFH provisions of the Sustainable Fisheries Act are designed to protect fishery habitat from being lost due to disturbance and degradation. The act requires that EFH must be identified for all species federally managed under the Pacific Fisheries Management Council (PFMC). PFMC is responsible for managing commercial fisheries resources along the coasts of Washington, Oregon, and California. Managed species are covered under three fisheries management plans: Pacific Groundfish Fishery Management Plan, Coastal Pelagic Fishery Management Plan, and Pacific Salmon Fishery Management Plan.

## **STATE REGULATIONS**

### **California Endangered Species Act**

Pursuant to the CESA and Section 2081 of the Fish and Game Code, a permit from DFG is required for projects that could result in the take of a state-listed Threatened or Endangered species. Under CESA, the definition of “take” is understood to apply to an activity that would directly or indirectly kill an individual of a species, but the definition does not include “harm” or “harass,” as the federal act does. As a result, the threshold for a take under the CESA is typically higher than that under the ESA. Take may be authorized by DFG as long as it is incidental to an otherwise lawful activity and the impacts of authorized take must be minimized and fully mitigated.

### **California Fish and Game Code Section 2800 et seq. – Natural Communities Conservation Planning Act**

The Natural Communities Conservation Planning (NCCP) Act of 1991 was established by the California legislature, is directed by DFG, and is being implemented by the state, and public and private partnerships to protect habitat in California. The DFG NCCP program is the mechanism for implementation of the NCCP Act. As opposed to the single species interpretation of the ESA, this act aims at protecting many species using a regional approach to habitat preservation. NCCPs describe conservation programs designed to minimize and mitigate effects to specified biological resources. The program takes a broad-based ecosystem approach to conservation planning. Its primary objective is to conserve natural communities at the ecosystem scale while accommodating compatible land uses. An NCCP identifies and provides for the regional protection of plants, animals, and their habitats, including species protected under CESA, while allowing compatible and appropriate economic activity.

### **California Fish and Game Code Sections 3503 and 3513 – Protection of Birds**

Section 3503 of the Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 specifically states that it is unlawful to take, possess, or destroy any raptors (i.e., eagles, hawks, owls, and falcons), including their nests or eggs. Section 3513 of the California Fish and Game Code provides for adoption of MBTA’s provisions. It states that it is unlawful to take or possess any

migratory nongame bird as designated in the MBTA or any part of such migratory nongame bird. These state codes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of nongame, migratory birds. Typical violations include destruction of active nests resulting from removal of vegetation in which the nests are located. Violation of Sections 3503.5 and 3513 could also include failure of active raptor nests resulting from disturbance of nesting pairs by nearby project construction.

### **Fully Protected Species under the Fish and Game Code**

Protection of fully protected species is described in four sections of the Fish and Game Code that list 37 fully protected species (Fish and Game Code Sections 3511, 4700, 5050, and 5515). These statutes prohibit take or possession at any time of fully protected species. DFG is unable to authorize incidental take of fully protected species when activities are proposed in areas inhabited by those species. DFG has informed non-federal agencies and private parties that they must avoid take of any fully protected species when carrying out projects.

### **California Fish and Game Code Section 1602 – Streambed Alteration**

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream or lake in California that supports wildlife resources are subject to regulation by DFG, pursuant to Section 1602 of the California Fish and Game Code. Section 1602 states that it is unlawful for any person, governmental agency, state, local, or any public utility to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake without first notifying DFG of such activity. The regulatory definition of stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports wildlife, fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or have supported riparian vegetation. DFG's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife.

### **Porter-Cologne Water Quality Control Act**

Under the Porter-Cologne Water Quality Control Act, "waters of the state" fall under the jurisdiction of the Regional Water Quality Control Board (RWQCB). Under the act, the Regional Board must prepare and periodically update its Basin Plan. Each Basin Plan sets forth water quality standards for surface water and groundwater, as well as actions to control non-point and point sources of pollution to achieve and maintain these standards. Projects that affect wetlands or waters must meet waste discharge requirements of the Regional Board, which may be issued in addition to a water quality certification or waiver under Section 401 of the CWA.

### **BUTTE COUNTY GENERAL PLAN**

The Conservation element of the Butte County General Plan (approved in 1971) provides the following guidance regarding wildlife and fisheries resources, which are applicable to the proposed project.

#### **Wildlife**

Acknowledgment by game management officials of deterioration of existing wildlife habitat by intrusion of urban development, with the possibility of certain species becoming endangered to the point of extinction, should also be a consideration of land use.

The migratory routes of wildlife which have been established by the basic survival requirements of the individual species should be recognized as an integral part of the ecosystem.

Riparian lands which support streamside vegetation become extremely important inasmuch as the food and cover these lands provide are necessary for a great variety of wildlife (i.e., pheasants, quail, doves, songbirds and a large



number of fur-bearing mammals). This particular type of habitat, by the very nature of its aesthetics, is in great demand for development and in many areas has been totally eliminated by intensive land use. Two of these remaining areas of “premium riparian habitat” in the State of California are located in Butte County, one on the Sacramento River from Keswick to the Delta, which includes Butte County, and the other the Feather River from Oroville south to the Sutter and Yuba County lines. These areas should be very carefully controlled to protect this environment if the wildlife that depends on this particular habitat is to continue to survive.

## **Fisheries**

Within the Protected Waterways Plan (Initial Element), a report was prepared by a study staff assembled from the five departments in The Resources Agency: Fish and Game, Parks and Recreation, Water Resources, Navigation and Ocean Development, and Conservation (Division of Forestry) in which Chapter II is directed to Section 3 of the Protected Waterways Act which requires, among other elements, specific identification of waterways for “extraordinary value.”

Butte County possesses several waterways which have been classified in this report as possessing extraordinary value as fisheries. The classifications are Class I, Premium Waterways; Class II, Very Good Waterways; and Class III, Important Waterways. These fishery classifications include anadromous fish and inland fish. Anadromous fish include King and Silver Salmon, Steelhead Trout, Striped Bass, American Shad, and White and Green Sturgeon, while inland fish include cold-water and warm-water species (i.e., Trout, Bass, Sunfish and Catfish).

The Sacramento and Feather Rivers, Butte Creek and Big Chico Creek received Class I, Premium, for anadromous fish, while Butte Creek, Fall River, French Creek and the Little North Fork of the Middle Fork of the Feather River received Class III, Important, for inland fish (Trout). The Sacramento and Feather Rivers also received classifications for inland fish: the Sacramento, Class I, Premium; the Feather, Class II, Very Good. Lake Oroville received Class I for combination reservoir (inland fish). Inasmuch as the Middle Fork of the Feather River from its source to Lake Oroville has been placed in the National Wild and Scenic Rivers Act, the extraordinary values of this waterway have already been recognized.

The preservation of these already classified extraordinary fisheries and all other waterways depends entirely on all land use, not just the land immediately adjacent to any one development.

Healthy waterways which contain clean cobbles create ideal spawning beds and create the habitat required for aquatic insects that are essential as food for fish. Sedimentation, siltation and turbidity destroy the basic conditions required for spawning beds and aquatic insect production.

Soil erosion occurs naturally, but as man alters the soil, vegetation and runoff, the problems are accelerated. Intensified land use within areas of severe soil erodibility greatly increases the sedimentation conditions in waterways.

## **OTHER LOCAL REGULATIONS**

See Section 3.3.1 of this EIR, “Local and Regional Conservation Planning,” for a description of the BSRSP General Plan and EIR, Sacramento River Conservation Area, Sacramento Wildlife Area Management Plan, and USFWS Comprehensive Conservation Plan.

### 4.4.3 ENVIRONMENTAL IMPACTS

#### THRESHOLDS OF SIGNIFICANCE

These significance thresholds are based on relevant provisions of CEQA, the State CEQA Guidelines, environmental questions in Appendix G of the Guidelines, and significance criteria used in other relevant environmental compliance documents for similar projects.

The proposed habitat restoration project would be considered to have a significant effect on biological resources if it would:

- ▶ Result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by DFG or USFWS;
- ▶ Result in a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA;
- ▶ Conflict with any local policies or ordinances protecting biological resources;
- ▶ Conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or state habitat conservation plan;
- ▶ Result in the substantial loss or degradation of native vegetation;
- ▶ Result in a substantial net loss of important wildlife habitat, including habitat occurring on agricultural fields;
- ▶ Result in a substantial net loss of important fisheries habitat, or EFH;
- ▶ Result in a construction-related temporary loss of substantial areas of native habitat or a substantial disturbance of sensitive wildlife on or near the project site;
- ▶ Result in a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS;
- ▶ Result in a substantial reduction of the habitat of a fish or wildlife species;
- ▶ Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- ▶ Cause a fish or wildlife population to drop below self-sustaining levels, or threaten to eliminate a plant or animal community; or
- ▶ Result in a substantial reduction in the number or restrict the range of an endangered, rare, or threatened plant or animal.

The proposed project would not result in impacts to federally protected wetlands; conflict with any local policies or ordinances protecting biological resources; conflict with an adopted habitat conservation plan; or adversely affect riparian habitat or other sensitive natural communities. Rather, the restoration of the project site would restore riparian habitat and would increase the amount of protected biological resources in the project area. Therefore, no further discussion pertaining to these thresholds of significance is included in this analysis.

## 4.4.4 IMPACT ANALYSIS

### Plants

**IMPACT 4.4-a** **Change in Habitat Conditions.** *Implementation of the proposed project would involve restoration of native Sacramento River riparian habitat on land that has been actively cultivated. It would not result in the loss or disturbance of native habitats or special-status plant species because these resources are not present in areas that would be disturbed during restoration activities. Restoration of native habitat would, in fact, have a long-term **beneficial** effect to native vegetation and associated plant species.*

Restoration of riparian habitat at the project site would occur on approximately 150 acres of almond and walnut orchards that has been in continual cultivation for at least 10 years (the age of the youngest cohort of orchards). These lands would be taken out of almond and walnut production and restored to native habitat, including a combination of mixed riparian forest, valley oak forest, cottonwood riparian forest, valley oak savanna, and valley needlegrass grassland (Exhibits 3-7 and 3-8). This restoration could temporarily reduce the local populations of common plant species (ruderal species along the edges of the orchards), but these species are locally and regionally abundant and are not considered sensitive. Sensitive habitats, including Great Valley willow scrub, Great Valley cottonwood riparian forest, and freshwater marsh, are present adjacent to the project area. In addition, six special-status plant species have potential to occur in riparian and freshwater marsh habitats adjacent to the project area. However, none of these habitats would be adversely affected by the proposed restoration project, and the project would result in a long-term increase in the overall amount of sensitive habitat within the project area. Furthermore, the proposed project would support Park Plan Goal ER-1.1 and Guideline ER-1.1-1, which calls for restoration on parcels acquired for habitat values. Therefore, impacts to vegetation, including sensitive habitats and special-status plants, would be **beneficial**.

**IMPACT 4.4-b** **Introduction and Spread of Invasive Plants (Weeds).** *Implementation of the proposed project would involve initial ground clearing and an eventual reduction in the active management and control of nonnative invasive plants from the present level associated with agricultural activities on the project site. The restoration plans for both the Singh Unit and the Nicolaus property have specific measures for the control of nonnative invasive plant species. Therefore, the potential for project implementation to increase the risk of spreading nonnative invasive plant species into adjacent existing native habitats is low. The potential introduction and spread of nonnative invasive plants would be a **less-than-significant** impact.*

A number of nonnative species tracked by CDFA and Cal-IPC and considered serious problems in native ecosystems and rangelands are present in the existing riparian habitat adjacent to the project site and in the fallow edges and roadsides along the orchards. These include giant reed, yellow-star thistle, Himalayan blackberry, tamarisk, perennial pepperweed, tree-of-heaven, eucalyptus, periwinkle, poison hemlock, edible fig, black locust and wild almond. As part of the ground clearing and replanting that would take place as part of the habitat restoration and establishment of recreation facilities there is potential for these species to colonize the open ground, establish populations, and become of source of spread and future infestations in neighboring areas where those species did not yet exist. However, the restoration plans for both units have specific maintenance schedules for control of nonnative weed species, consistent with Park Plan Goal ER-1.3 and Guidelines ER-1.3-1 and ER-1.3-2. These plans call for active maintenance for three years following implementation and include control of weeds through herbicide application, mowing, and disking where appropriate (see Appendix C for details). The ultimate objective of the weed control measures is to optimize growth of the planted riparian species past a point where they can compete effectively with the nonnative invasive plant species. With these maintenance measures in place as part of the project description, the impact from introduction and spread of nonnative invasive plants is expected to be **less than significant**.



## Wildlife

**IMPACT**     **Potential Effects to Wildlife.** *Implementation of the proposed project would result in an overall **benefit** to wildlife. Approximately 150 acres would be restored from cultivated orchard to native riparian habitat, which supports a greater diversity and abundance of wildlife, including many special-status species.*

**4.4-c**

Implementation of the proposed project would result in an overall **benefit** to wildlife. Approximately 150 acres would be restored from cultivated orchard to native riparian habitat, which supports a greater diversity and abundance of wildlife, including many special-status species. The benefits of riparian restoration have been confirmed by recent research, which has shown substantial population increases for a variety of bird species at riparian restoration sites, with eight species increasing by more than 10% in ten years, and with significantly higher rates of population growth at restored sites than in the Sacramento Valley as a whole or the state of California (Gardali et. al., 2006). In addition, the USFWS proposal to delist valley elderberry longhorn beetles from their current threatened status was due in part to the success of past riparian restoration projects (USFWS 2006), and the first Central Valley nest of endangered least Bell's vireos in over 60 years was recorded in a San Joaquin River restoration site in 2005 (USFWS 2005b).

Restoration of native habitats would eliminate existing orchard habitat which is inhabited by some common wildlife species such as American robin, European starling, gopher snake, western gray squirrel, and black rat. However, most of these species are also likely to use the riparian habitats that would replace the orchards. In addition, orchards and the wildlife they support are locally and regionally common. Therefore, no substantial net loss of wildlife habitat would occur, and the restoration of higher-quality riparian habitat would be considered beneficial.

The proposed project would also enhance existing wildlife movement corridors along the Sacramento River and Mud Creek, by adding 150 acres of riparian habitat to an existing 2,887 acres of protected and restored habitat along the Sacramento River between river miles 199 and 193, and shortening the distance between riverside habitat parcels. Wildlife movement is not expected to be substantially affected by construction and maintenance of the proposed recreational facilities. Relatively small patches of orchard would be disturbed and/or removed by facility development, and the existing riparian habitat adjacent to the project site would remain undeveloped. Potential project impacts to wildlife corridors would thus be expected to be beneficial.

The proposed expansion of recreational facilities, including parking, campgrounds, picnic/day use areas, and trails is expected to increase visitor use of existing habitats adjacent to the project site and within the Park as a whole. Potential secondary impacts to wildlife that could result from increased visitor use include disturbance from visitor activities (e.g., hiking and camping), introduction/expansion of invasive species, increased populations of native predators (e.g., crows and raccoons) due to the availability of human food waste, and disturbance by domestic dogs. However, such impacts would be minimized by the Park Plan goals and guidelines, which would be followed for both short-term construction and long-term maintenance of the proposed project. These measures include monitoring of special-status species within the Park and development of specific measures to avoid and minimize adverse impacts that could result from facility construction, maintenance activities, and visitor use (Goal ER-1.2 and Guidelines ER-1.2-1 through ER-1.2-5). In addition, the Park Plan includes minimization measures for the potential impacts of nonnative animals on wildlife in the Park, through monitoring efforts, development and implementation of a control plan, and public education to reduce release and feeding of nonnative animals (Goal EIR-1.4 and Guidelines ER-1.4-1 through ER-1.4-3). Further, all of the new facility development is proposed on existing orchard land which currently provides little habitat value, and the majority of such impacts would be expected to remain within the developed Nicolaus parcel, with a lesser amount of additional use impacts on the adjacent trails and habitats.

The project area and adjacent sensitive habitats are known to support several special-status wildlife species and could support a number of others (Table 4.4-3). Aquatic species, such as giant garter snake and western pond turtle, would not be adversely affected by the proposed project because restoration activities would be restricted to

disturbed upland habitats that are unlikely to be utilized by these species. Similarly, ringtail would not be adversely affected because it is restricted to riparian habitat and is unlikely to use the project site while it remains in cultivation. Ringtail would instead benefit from the proposed project's restoration of riparian habitat.

**IMPACT 4.4-d**     **Potential Effects to Valley Elderberry Longhorn Beetles.** *No elderberry shrubs would be directly affected by habitat restoration activities or recreation facilities construction, because these activities would be restricted to areas that have long been subject to high levels of disturbance from agricultural activities and do not support any elderberry shrubs. In addition, the restoration plans do not include planting elderberry shrubs. However, elderberry shrubs that could support valley elderberry longhorn beetle are likely to occur adjacent to the project site. Therefore, focused surveys for elderberry shrubs would be conducted on land within 100 feet of the project site prior to construction. If any elderberry shrubs with 1.0 inch or greater stem diameter are found, USFWS conservation guidelines for valley elderberry longhorn beetles would be followed. Therefore, the proposed project would result in a **less than significant** impact to valley elderberry longhorn beetles.*

No elderberry shrubs would be directly affected by habitat restoration activities or recreation facilities construction, because these activities would be restricted to areas that have long been subject to high levels of disturbance from agricultural activities and do not support any elderberry shrubs. In addition, the proposed restoration plans do not include planting any elderberry shrubs. This would minimize the potential for recruitment of elderberry shrubs into areas subject to regular maintenance or other disturbances (levees, other flood control structures, and/or adjacent agricultural lands) that could result in adverse effects to the shrubs.

Elderberry shrubs that could support valley elderberry longhorn beetle are likely to occur adjacent to the project site. Although there is little potential for disturbance to nearby elderberry shrubs during project implementation, focused pre-construction surveys for elderberry shrubs would be conducted on land within 100 feet of the project site. If elderberry shrubs with 1.0 inch or greater stem diameter are found, USFWS conservation guidelines for valley elderberry longhorn beetles would be followed by establishing a 100-foot buffer around such shrubs, wherever feasible, to completely avoid potential impacts to valley elderberry longhorn beetles (USFWS 1999a). Earthmoving activities, pesticide use, and other construction and maintenance activities with potential to impact valley elderberry longhorn beetles and their host shrubs would be avoided within these buffer zones. If the establishment of a 100-foot buffer is infeasible, then USFWS would be consulted. It is anticipated that either a new buffer width would be agreed upon along with additional protections for the safety of the beetles and shrubs, or that shrubs that could not be adequately protected would be transplanted to a protected location before construction would begin, in accordance with established USFWS guidelines (USFWS 1999a). If valley elderberry longhorn beetles are delisted in the future, as has recently been proposed by USFWS (USFWS 2006), these measures may be amended to conform to any revised USFWS guidelines regarding this species.

Because the project would avoid adverse effects to elderberry shrubs and valley elderberry longhorn beetles, the proposed project would result in a **less-than-significant** impact on valley elderberry longhorn beetles.

**IMPACT 4.4-e**     **Potential Disturbance of Nesting Raptors, Special-status Birds, Migratory Birds, and Bats.** *Implementation of the proposed project could result in a **potentially significant** construction-related loss and/or disturbance of birds and bats nesting or roosting in or near the project site.*

Implementation of the proposed project could result in construction-related loss and/or disturbance of birds and bats nesting or roosting in or near the project site. Several special-status birds are known or have the potential to nest adjacent to the project site (Table 4.4-3). Many common bird species may also nest in or near the project site, and are protected under MBTA and the California Fish and Game Code, with raptors receiving additional protection. Restoration activities could result in direct loss of orchard nests and bat roosting sites when orchard vegetation is removed. Birds nesting in habitat adjacent to the project site could also be disturbed by restoration activities, potentially resulting in nest abandonment and mortality of eggs or chicks. These disturbances could result in a **potentially significant** impact.

## Fisheries

**IMPACT**     **Potential Effects to Fisheries.** *Implementation of the proposed project would not result in loss or disturbance of fish habitat or special-status fish because these resources are not present in areas that would be disturbed during restoration activities. The creation of recreational facilities would involve construction activities and increased visitation of the project area; however, this potential impact would be minimized with implementation of a storm water pollution prevention plan and therefore would not result in significant impacts to the Sacramento River fisheries. Restoration of riparian habitat would be expected to have a long-term **beneficial** effect to fish.*

4.4-f

Implementation of the proposed project would result in an overall net benefit to fisheries and aquatic resources of the Sacramento River. Implementation of the proposed project would not directly alter any instream fish habitat as all project activities and construction would take place on the floodplain. Implementation of the habitat restoration would utilize standard agricultural practices already in use throughout the project area, including orchard removal, discing, seeding, and planting. Irrigation system modification and expansion would include standard trench and backfill techniques. Minor and temporary increases in sediment load to the river could also occur during flood events. Increased sediment input could increase turbidity and reduce feeding efficiency of juvenile and adult fish. However, native vegetation would be planted concurrently or soon after removal of existing vegetation to minimize the potential for severe erosion to occur on disturbed, unprotected land. Because the Sacramento River is typically a turbid system during flood events, additional sediment input resulting from the proposed restoration project activity would be comparatively minimal, and is not anticipated to have any noticeable effect relative to the overall condition of the river. Gravel recruitment rates would not be significantly affected. In addition, restoration of agricultural lands to natural riparian areas would result in long-term beneficial effects to fish in the Sacramento River by increasing the complexity of the floodplain aquatic environment and providing cover, food, and other habitat components.

The construction of recreational facilities on the Nicolaus property would convert approximately 21 acres from orchard and related agricultural facilities to recreational day use facilities, campgrounds, and an access road. Ground-disturbing activities could potentially result in soil erosion and/or sedimentation of local drainages or the Sacramento River channel and subsequent water quality degradation, which in turn could result in potential adverse effects to special-status fish. However, these impacts would be minimized with implementation of a Storm Water Pollution Prevention Plan and best management practices (see Impact 4.3c in Section 4.3, “Hydrology, Water Quality, and River Geomorphology”). Additionally, replacing the existing agriculture land use with restored riparian habitat and recreation facilities would result in a decrease in pesticide and herbicide applications, reducing the potential impacts of these chemicals to fish during flood events. Operation of recreational facilities would increase the amount of vehicle traffic in the project area, thus potentially increasing the amount of vehicle-related contaminants entering the Sacramento River during flood events (see Impact 4.3d in Section 4.3, “Hydrology, Water Quality, and River Geomorphology”). However, any increase in vehicle-related contaminants on the project site would be expected to be relatively small due to the anticipated low-intensive and seasonal use of the area.

Because the benefits to fisheries of the proposed habitat restoration are expected to be more substantial than any potential construction, maintenance, or visitor use impacts that may occur, the overall effect of the proposed project is considered **beneficial** to fish habitat and special-status fish species.

### 4.4.4 MITIGATION MEASURES

The proposed project would implement specific actions to ensure avoidance of impacts to plants, wildlife, and fisheries during both habitat restoration and recreation facility development at the project site. These actions support the goals and guidelines of the Park Plan, which emphasizes the protection of special-status species as well as the restoration and conservation of native ecosystems.



#### Mitigation Measure 4.4-e: Avoidance of Disturbance to Nesting Raptors and Special-status Birds.

Osprey, white-tailed kite, northern harrier, Cooper's hawk, Swainson's hawk, western yellow-billed cuckoo, bank swallow, loggerhead shrike, yellow warbler, and yellow-breasted chat are known to or have potential to nest adjacent to the project site. In addition to these special-status species, the nests of all raptor species are protected under §3503.5 of the California Fish and Game Code. Nest disturbance may be entirely avoided by limiting construction to the non-breeding season (generally September 1 to January 31) to the extent feasible. To avoid nest disturbance and a potential reduction in fledging success resulting from construction activities during the breeding season (February 1 to August 31), focused surveys for raptors and special-status birds would be conducted by a qualified biologist no more than 14 days prior to the beginning of construction. Surveys for Swainson's hawk nests would include all areas of suitable nesting habitat within 0.25-mile of the two sites. To the extent feasible, guidelines provided in the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in the Central Valley (Swainson's Hawk Technical Advisory Committee 2000) would be followed. Surveys for other raptors and special-status birds would include suitable nesting habitat within 500 feet of each site.

If no active nests are found, no further measures would be needed. If active nests are found, impacts would be avoided by the establishment of appropriate buffers and/or nest monitoring by a qualified biologist. The size of the buffer would be determined by a qualified biologist and may vary, depending on the species biology, location, nest stage, and specific construction activities to be performed while the nest is active. No construction activities would occur within a buffer zone until a qualified biologist confirms that the nest is no longer active.

#### Mitigation Measure 4.4-e: Avoidance of Disturbance to Nesting Migratory Birds and Roosting Bats.

As discussed for nesting raptors and special-status birds, nest disturbance of other migratory birds may be entirely avoided by limiting construction to the autumn and winter non-breeding season to the extent feasible. To avoid nest disturbance and a potential reduction in fledging success during any construction activities during the spring and summer breeding season, the project site's walnuts and almonds would be harvested for the last time the previous autumn, and standard orchard maintenance practices (e.g., mowing and herbicide applications) would continue until construction begins to discourage bird nesting and bat roosting in the orchard prior to felling of the trees.

Because orchards would be restored to native habitats anticipated to support a higher diversity and abundance of wildlife species without significantly reducing populations of the species currently on site, the proposed restoration of native riparian habitat would have a long-term beneficial effect on wildlife. Potential impacts to existing wildlife that may occur during construction, maintenance, and visitor use of the proposed riparian habitat and recreational facilities would be expected to be minor, and would be largely avoided or minimized through the wildlife protection measures described in Mitigation Measure 4.4-e. These measures comply with the Park Plan and all applicable state and federal laws. Because the benefits to wildlife of the proposed habitat restoration are expected to be more substantial than any potential construction, maintenance, or visitor use impacts that may occur, the overall effect of the proposed project is considered *beneficial* to wildlife species, and there would not be any substantial adverse effect to special-status species, their use of wildlife movement corridors, or nursery sites.